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ON THE HABITS OF THE KANGAROO RATS IN CAPTIVITY.

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SOME time during the early part of the month of June or the latter part of May, 1901, Mr. Edward S. Schmid, a dealer in pets and animals, with an establishment at 712 Twelfth Street, Washington, D.C., received from one of his collectors in Kansas some two dozen specimens of "kangaroo rats." At first glance I did not recognize the species; but Mr. Schmid, with his usual generosity, presented me with three of the finest specimens in the lot, — two males and a female.

Upon taking these to my study I consigned them to a roomy cage with an inch or more of soil on the bottom of it, and I soon found that these very interesting little mammals fed with great avidity upon hemp and canary seed mixed up with a supply of wheat grains. They also drank freely of water placed for them in little china vessels.

After they had been in my possession a day or two, I found they had become sufficiently accustomed to my presence and handling to allow me to make the attempt to obtain photographs of them. This I undertook on two separate occasions, selecting for the purpose the darker and better marked male animal of the trio. Both times I succeeded in obtaining life-size pictures, and the reproductions of my results, reduced rather more than one-half, illustrate the present article. Fig. 1 represents the animal as he appears when asleep during the day-time, and Fig. 2 shows him when wide awake and engaged in busily nibbling upon a piece of root at the entrance of a shallow burrow he had dug for himself. As my methods of obtaining such photographs as these have been fully set forth by me during the past year or two in the technical journals devoted to scientific photography in this country and abroad, it will not be necessary to touch upon that question here.

Upon exhibiting my photographs to Mr. Gerret S. Miller, Jr., of the Mammal Department of the United States National Museum at Washington, D.C., he at once pronounced them to be specimens of the kangaroo rat described by Dr. J. A. Allen as *Perodipus richardsoni*, a species, so far as at present known, confined to Indian Territory, Kansas, and Oklahoma.

During the last sixteen or seventeen years the number of new North American species of jumping mice and kangaroo rats described by our mammalogists has been something phenomenal.



FIG. 1.—*Perodipus richardsoni* (Allen). ♂ (asleep). Less than $\frac{1}{2}$ nat. size.
Photographed from life by the author.

Other genera have been similarly increased. When the United States National Museum published its provisional list of mammals of North America in 1884 (*Proc. U. S. Nat. Mus.*, Vol. VII, Appendix, p. 585), there were but two subspecies of *Dipodomys* recorded, and but one species of *Zapus*. If we turn now to the excellent volume published by Mr. D. G. Elliot, curator of the Department of Mammals of the Field Columbian Museum of Chicago (*Zoöl. Ser.*, Vol. II, Chicago, 1901), entitled *A Synopsis of the Mammals of North America and the Adjacent Seas*, we find that there was recorded at the time of the issuance of that book no less than 23 kangaroo rats and 20

jumping mice (*Zapus*); 13 of the former are of the genus *Dipodomys* and 10 of *Perodipus*, the genus to which our present subject belongs. (See pp. 236, 237; Family (VI) *Heteromyidae*; and for three views of the skull of *Perodipus agilis*, p. 237.) Other genera of this extensive group of our smaller rodents have likewise been largely added to, and a great many new species described of recent years. Mr. Elliot has since published a supplement to the volume here referred to, and this contains the descriptions of still other species.

I found my specimens of *P. richardsoni* extremely gentle in disposition, and any one of them would allow me to catch hold of it with my hand, and no amount of handling or even gentle squeezing could induce the little animal to bite or scratch. On one occasion I let them all out in my study, when it was very amusing to see their various antics and capers. They were as full of fun and play as could be, and soon seemed to take a genuine delight in my attempts to recapture them. They hopped about with great agility on their hind pair of kangaroo-like legs, while the little short pair of anterior limbs were curled inwards on the chest. At these times the animal's tail is simply dragged behind it, being in contact with the ground for its entire length. Its body is held obliquely, its axis making rather a small angle with the surface over which it is passing, but if occasion occurs for it to use its fore legs, they are brought into play at once, either for feeding, climbing, or burrowing. They are able climbers, and the rapidity with which they can dig a burrow in ordinary ground is astonishing. They use the fore feet to perform the digging part and the long and strong hind legs to kick the loosened soil out of their way behind, as it accumulates every moment or so. In soft soil one of these little mammals can put itself out of sight in less than a minute by digging, and it really seems to enjoy the operation. Among themselves they are somewhat inclined to be quarrelsome, biting and scratching one another sometimes without any apparent cause, while at other times they huddle together in a corner and sleep as peacefully as so many snails. The borders of the ears of one of these males, however, exhibit a few small healed-up nicks and notches that have very much

the appearance of having been acquired during combats with its fellows. During most of the day they pass the time in sleep, but they become very active towards dusk and probably are active all night. So it is that they rarely feed during the daytime, while after dark they are hearty consumers of anything that takes their fancy, especially of such grain and seeds as I have mentioned above. When sleeping they sometimes curl their long tails about them in a circle on the ground, while the nose and face is poked well down in between the fore legs, the body thus looking like a round puffball of hair surrounded



FIG. 2. — *P. richardsoni*. Same specimen as shown in Fig. 1. Feeding. Less than $\frac{1}{2}$ nat. size. Photographed from life by the author.

by a single coil of the bicolored and longitudinally striped tail, the latter terminating in a brush at its end. Again they may sleep in the attitude shown in Fig. 1, where the animal had mounted a little log for the purpose and had been in sound repose for fully ten minutes, without moving, before I exposed my plate upon him. At other times they sleep upon their backs or sides, stretched out like little kittens or other small animals that assume such attitudes when enjoying a blissful doze in the warm sunshine.

This kangaroo rat is a very neat and cleanly little creature, frequently dressing its soft fur much after the fashion of the

common house mouse. Sitting up like a kangaroo, it will vigorously, and with both fore paws, dust its nose and face for a few seconds, when, with equal alacrity, it will pass to a general scratch of its sides and back, terminating the operation by starting at the root of its long and stout tail and rapidly passing the entire appendage through its fore paws to the very tip, while it is, as it were, at the same time briskly titillated with the lips and teeth at the front of the mouth. It is very amusing to observe the evident satisfaction it has in performing this act.

In addition to preening thus the face, body, and tail, it will, to dress the hair of the belly and back, push itself along in the dust or earth by means of its hind legs, and afterwards vigorously brush out the fur with its fore paws.

Another peculiar habit I observed in *Perodipus* was the way it had of using its fore paws for quickly pulling out the cheek pouches. By this means the pouches were completely turned inside out; they were then stretched, scratched, and dusted for a second or two, after which the animal tucked them back into position with equal rapidity.

As in the case with the majority of the *Muridæ*, when startled by sharp and sudden noises these nervous little animals will involuntarily spring from the ground for a centimeter or more; when coming down again they will stand and gently grit their teeth together, while their eyes appear as though they were about to pop out of their orbits. At other times, particularly when feeding, the eyes are often kept not more than two-thirds open, and the animal then has an especially gentle look (Fig. 2).

Perodipus occasionally, at long intervals, gives vent to a peculiar note not altogether unlike the low sound of a cat when calling her kittens together, though not nearly so loud or distinct.

If kept in a roomy cage with five or six inches of soil on the bottom, where it is perfectly quiet and sunny, I see no reason why this species would not breed in captivity, and in any event they make very interesting and gentle little pets in confinement, quite equaling any of the squirrels, or even the famous dormouse of Europe, in this regard.